Chapter 4
LINE ANALYSES AND PROJECT SELECTION

Two project candidates were analyzed for funding assistance. The analyses were performed using the standard federal methodology which is contained in Appendix A.

The methodology uses present value summations of benefits and costs to arrive at a benefit-cost ratio. A candidate project must have a b-c ratio in excess of 1.0 in order to be eligible for assistance.

Benefits used in the analyses consist of primary transportation benefits (transportation cost savings) and secondary benefits relating to employment, relocations and highway impacts if businesses are forced to close, relocate or convert traffic to truck transport. The analyses are performed over a ten-year planning horizon using a discount rate which is established each year by the Federal Railroad Administration.

EASTERN IDAHO RAILROAD
REHABILITATION PROJECT

The Eastern Idaho Railroad was formed from two clusters comprised of several Union Pacific branch lines (totaling about 270 miles in length) that the carrier spun off in eastern Idaho in 1993. The line segment that is the subject of this analysis is the West Belt Industrial Lead (sometimes called the Menan Branch) of the Eastern Idaho which runs 10.4 miles between Ucon, just outside of Idaho Falls, and Menan in Jefferson and Bonneville Counties as shown on Figure 1. The line serves the stations of Coltman, Grant, Lewisville, and Midway in addition to its terminal points.

Service Area

The area served by the branch is an agricultural area producing principally potatoes. The line's rail traffic reflects this economic activity.

Line Condition

The condition of the track is such that it is currently classified as excepted track based on Federal Railroad Administration track safety standards with a maximum permissible speed of 10 mph. The majority of the rail on the line is 70-lb. jointed which is surface bent due to poor tie conditions. Surface and line are consistently poor over the entire length and cross tie conditions are poor with defective joint ties and numerous clusters of defective ties. The line is more fully described in Table 1.

Rail Use

There are nine rail users (shippers and consignees) located on the line, with at least one located at each station. Commodities moving over the line consist of agricultural products such as potatoes and corn, mostly fresh and dehydrated potatoes, and agriculturally related commodities such as fertilizers and fertilizer materials. Annual traffic approximates 1,000 carloads.


EASTERN IDAHO RAILROAD
REHABILITATION PROJECT
UCON to MENAN
MENAN
Pop. 601
4798'
LEWISVILLE
Pop. 471
4790'
RIGBY
Pop. 2,681
4968'
UCON
Pop. 895
4808'
Lewisville
Knolls
Little
Buttes
4964'
Kellers
Island
OXBOW
SLOUGH
Lorenzo
4862'
Annis
Rigby Airport
4845'
Coltman
Payne
U.P.R.R. (West Belt Branch)
(West Belt Br.)
STC 6742
STC 6746
STC 6715
STC 6717
STC 6716
STC 6731
STC 6719
STC 6727
STC 6748
STC 6750
T. 5 N.

Table 1
LINE FACILITIES AND CONDITION
West Belt Industrial Lead
Eastern Idaho Railroad

Mileposts	0.0 to 10.7		
Stations	Ucon	MP	0
	Coltman	MP	2.6
	Grant	MP	4.6
	Lewisville	MP	8.7
	Midway	MP	9.6
	Menan	MP	10.4

Rail — Rail weight and location:

MP	0	- MP	0.45	90#
MP	0.45	- MP	2.73	70#
MP	2.73	- MP	2.90	131#
MP	2.90	- MP	10.70	70#

The vast majority of the rail on the line, 10.08 miles, is lightweight 70-Ib. jointed rail which has become surface bent from poor tie conditions.

Ties	Mixed hard and soft woods in fair to poor condition. Tie conditions vary over the line.
Tie Plates and Anchors	Many tie plates are missing contributing to the poor tie condition. Rail anchors are inadequate and those that do exist are ineffective.
Ballast	Native materials with standard ballast in places, typically as a light covering over native materials.
Surface/Line	Poor overall, F.R.A. excepted conditions.
Bridges	Total of 12 bridges, mostly timber pile, open deck trestles.
Roadbed/Drainage	Poor drainage and mud conditions throughout.
Grade Crossings	Total of 25, most with wood plank surfaces.
Vegetation	Fair overall weed and brush control except MP 8 - MP 10.7, poor.
Side Tracks	Side tracks exist at all stations listed.
Timetable Speed	10 MPH, F.R.A. excepted track.
Weight Limit	240,000 lbs.

Benefit - Cost Analysis

Project Alternative

The project alternative is rehabilitation and continued operation.

Null Alternative

The condition of the track, and especially the lightweight rail, dictates a major rehabilitation effort if the line is to remain in long-term service. As evident from the profit/(loss) statement presented later, the line would be operated at a loss if normalized maintenance of way and structures were considered. With rehabilitation, there is a projected operating profit, but it is not large enough to fund the needed work. Therefore, the physical needs of the track cannot be met from operating revenues and the null alternative is abandonment.

Project Description and Costs

The project will replace the existing 70-lb. jointed rail with 90-lb jointed rail , insert 11,770 new cross ties, rework the road crossings, and surface and line the track. It is anticipated that the project will be implemented over a period of time, approximately three years in three equal stages. The track will be in stable Class 2 condition with a maximum permissible speed of 25 mph throughout at the completion of the project.

The estimated cost of the project is the sum of the rehabilitation effort and the net liquidation value of the line. The rehabilitation of the track is estimated to cost $2.36 million with a credit for the materials released as detailed in Table 2. The net liquidation value of the track and right-of-way is estimated to be $220,463. Thus the total cost of the project is $2,581,061.

Project Benefits

The benefits of the project consist of transportation efficiency benefits that would result from avoiding abandonment of the line. These consist of avoidance of increased alternative transportation costs for existing and future traffic movements, and the improvement of the line's profit/(loss) statement resulting from increased revenues and decreased operating costs.

Increased traffic would result with rehabilitation as one shipper is waiting to see if the project will go forward before committing to a facility expansion, and two others would increase business if the cars could be picked up later in the day permitting them to prepare more product for shipping. As the shipments are fresh products, this is a real consideration. The

Table 2
REHABILITATION COST ESTIMATE
Eastern Idaho Railroad
(Class II Operation)

Cost Items	Miles	Unit Quantity	Unit	Unit Cost	Total Cost
Materials					
Rail, 90 lb., Relay	10.08	158.4	N-Ton	$330	$526,902
Rail, 90 lb., Relay	0.13	158.4	N-Ton	330.00	6,795
Joints, 90 lb., S.H.	10.08	320.0	Each	10.50	33,869
Joints, 90 lb., S.H.		105.0	Each	10.50	1,103
Tie Plates, S.S., S.H.	10.08	6,500.0	Each	1.50	98,280
Tie Plates, S.S., S.H.		540.0	Each	1.50	810
Rail Anchors, New	10.08	4,320.0	Each	0.85	37,014
Rail Anchors, New		6,552.0	Each	0.85	5,569
Bolts and Nutlocks, New	10.08	1,280.0	Each	1.85	23,869
Bolts and Nutlocks, New		308.0	Each	1.85	570
Turnouts, Relay		7.0	Each	5,000.00	35,000
Crossties, New	10.70	1,100.0	Each	30.00	353,100
Switch Ties, New		24.2	MBM	725.00	17,509
Spikes, New, 9/16" x 5 1/2"		398.0	Keg	90.00	35,820
Ballast	10.70	1,045.0	Ton	6.00	67,089
Crossing Boards & Screws		540.0	T.F.	60.00	32,400
Tie Plugs	10.08	18.0	BDS	25.00	4,536
Compromise Joints, S.H., 131/90 #		12.0	Each	185.00	2,220
SUBTOTAL MATERIAL COST					$1,282,455
Labor Costs					
Unload Ties and Remove Old Ties	10.70	1,100.0	Each	1.50	17,655
Unload Ballast	10.70	1,045.0	Tons	1.50	16,772
Unload Rail	10.08		Mile	1,000.00	10,080
Install Crossties	10.70	1,100.0	Each	15.00	176,550
Install Switchties		24.2	MBM	700.00	16,905
Install Rail	10.08		Mile	79,200.00	798,336
Install Turnouts		7.0	Each	7,000.00	49,000
Surface and Line	10.70		Mile	7,920.00	84,744
Rework Grade Crossings Including Paving		540.0	T.F.	120.00	64,800
SUBTOTAL LABOR COST					$1,234,842
REHABILITATION COST (Material and Labor)					$2,517,297
Less Salvage Value of Material Released					156,699
TOTAL REHABILITATION COST					$2,360,598

NOTE: Unit Values current as of --> December 1994
SOURCE: Wilbur Smith Associates

condition of the line forces the railroad to run over it earlier in the day in order to make connections than it would have to if the permissible speed were higher. Also, the carrier has to pay penalties when it misses connections which is occurring more frequently than it would if the line were rehabilitated. Increased traffic is conservatively estimated at an average of 500 cars per year once at least two thirds of the rehabilitation work is completed.

Shipper transportation efficiency benefits are estimated at $1.84 million per year prior to the threshold point of the project, and $2.54 million per year after that. The railroad's operations are expected to show a loss of $53,919 prior to rehabilitation and a profit of $70,139 after rehabilitation as shown on Tables 3 and 4. The final benefit is the salvage value of the line including the rehabilitation effort at the end of the project life.

Benefit-Cost Ratio

Table 5 contains the present value analysis depicting the computation of the benefit-cost ratio. The analysis is conducted with a project life of ten years and a discount rate of 3.6 percent as mandated by the Federal Railroad Administration. The present value of project costs is $2,413,111 and project benefits $19,980,181 as shown in the table leading to a positive B-C ratio of 8.28.

Table 3

WEST BELT OPERATING

PROFIT/(LOSS)

Before Rehabilitation

Revenue		$200,000
Costs		217,102
MW&S	128,400	
Transportation	60,384	
G&A	28,318	
ROV		36,817
NET		($53,919)

Table 4

WEST BELT OPERATING

PROFIT/(LOSS)

After Rehabilitation

Revenue		$300,000
		193,044
Costs		
MW&S	128,400	
Transportation	39,464	
G&A	25,180	
ROV		36,817
NET		$70,139

Table 5
BENEFIT -- COST ANALYSIS
Easternn Idaho Railroad
(1994 $)

	COSTS			BENEFITS							
Year	REHAB	NLV	Total Costs	Oper.	ansportation	RR P/(L)	Hwy	Salvage	Total Benefits	Net Benefits	Present Value Net Benefit
1994											
1995	786,866	220,463	1,007,329						1,782,944	(1007329)	(972325)
1996	786,866		786,866	0	1,836,863	53,919	0		1,782,944	996,078	928,055
1997	786,866		786,866	0	1,836,863	53,919	0		2,614,502	996,078	895,806
1998			0	0	2,544,363	70,139	0		2,614,502	2,614,502	2,269,603
1999			0	0	2,544,363	70,139	0		2,614,502	2,614,502	2,190,737
2000			0	0	2,544,363	70,139	0		2,614,502	2,614,502	2,114,611
2001			0	0	2,544,363	70,139	0		2,614,502	2,614,502	2,041,130
2002			0	0	2,544,363	70,139	0		2,614,502	2,614,502	1,970,203
2003			0	0	2,544,363	70,139	0		2,614,502	2,614,502	1,901,740
2004			0	0	2,544,363	70,139	0		2,614,502	2,614,502	1,835,657
2005			0	0	2,544,363	70,139	0		2,614,502	2,614,502	1,771,869
2006			0					947,759	947,759	947,759	619,985
PV's	2,200,309	212,802	2,413,111	0	19,027,131	330,066	0	619,985	19,980,181	17,567,071	17,567,071

Discount Rate	0	NPV	17,567,071	
		B/C Ratio	8.28	12/15/94

Table 6
REHABILITATION COST ESTIMATE
Eastern Idaho Railroad
PHASE I
(Class II Operation)

Cost Items	Miles	Unit Quantity	Unit	Unit Cost	Total Cost
Materials					
Rail, 90 lb., Relay	0.75	158.4	N-Ton	$330	$39,204
Joints, 90 lb., S.H.	0.75	320.0	Each	10.50	2,520
Tie Plates, S.S., S.H.	0.75	6,500.0	Each	1.50	7,513
Rail Anchors, New	0.75	4,320.0	Each	0.85	2,754
Bolts and Nutlocks, New	0.75	1,280.0	Each	1.85	1,776
Bolts and Nutlocks, New	5.25	128.0	Each	1.85	1,243
Crossties, New	6.00	1,100.0	Each	30.00	198,000
Switch Ties, New		20.0	MBM	725.00	14,500
Spikes, New, 9/16" x 5 1/2"		98.0	Keg	90.00	8,820
Ballast	6.00	1,000.0	Ton	6.00	36,000
Crossing Boards & Screws		128.0	T.F.	60.00	7,680
Tie Plugs	0.75	18.0	BDS	25.00	338
SUBTOTAL MATERIAL COST					$320,348
Labor Costs					
Unload Ties and Remove Old Ties	6.00	1,100.0	Each	1.50	9,900
Unload Ballast	6.00	1,000.0	Tons	1.50	9,000
Unload Rail	0.75		Mile	1,000.00	750
Install Crossties	6.00	1,100.0	Each	15.00	99,000
Install Switchties		20.0	MBM	700.00	14,000
Install Rail	0.75		Mile	79,200.00	59,400
Service Joints	5.25				13,125
Surface and Line	6.00		Mile	7,920.00	47,520
Rework Grade Crossings Including Paving		128.0	T.F.	120.00	15,360
SUBTOTAL LABOR COST					$268,055
REHABILITATION COST (Material and Labor)					$588,203
Less Salvage Value of Material Released					11,752
TOTAL REHABILITATION COST					$576,451

NOTE: Unit Values current as of --> December 1994
SOURCE: Wilbur Smith Associates

IDAHO, NORTHERN AND PACIFIC
REHABILITATION PROJECT

The Idaho, Northern and Pacific was formed from a cluster of branch lines spun off by the Union Pacific in 1983. The lines include one branch located in Oregon, but the remainder are located in several counties north and west of Boise as shown on Figure 2. The line segment lying in Payette and Gem Counties and connecting Payette, on the Union Pacific main track, with Emmet is the subject of this analysis. The line is 25 miles long and serves the intermediate stations of Eiffie, Fruitland, Buckingham, Tom Thumb and New Plymouth in addition to the terminal points.

Service Area

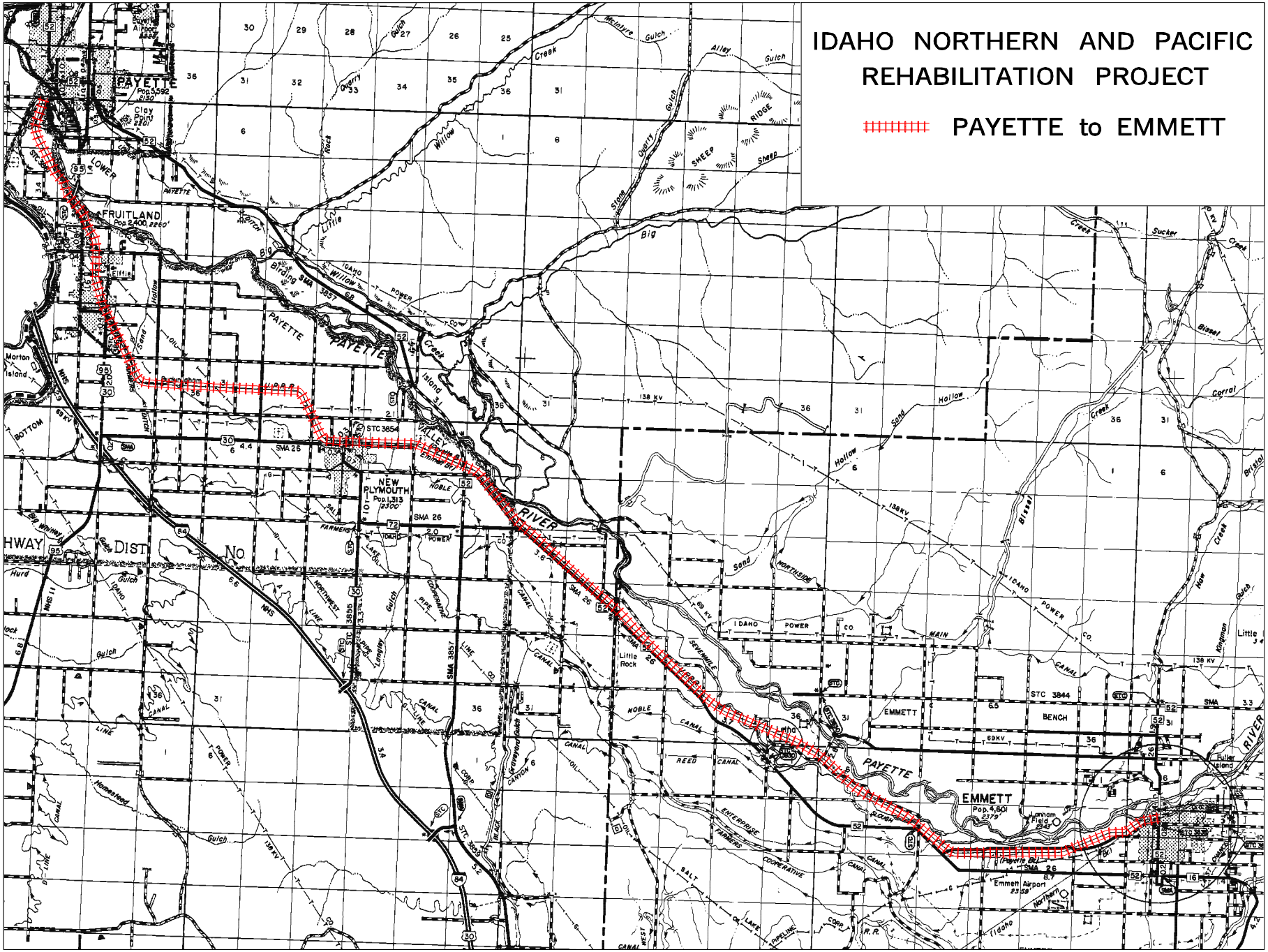
The area served by the affected lines is one of agricultural production immediately surrounding the subject segment, and timber production and processing further up the connecting segments. All of the traffic moves over the subject segment en route to its main track connection.

Line Condition

Although the timetable maximum speed was formerly 25 and 40 mph over most of the line, it has been lowered to 10 mph for the first 10 miles or so and 20 for the remainder due to deteriorated track conditions. Approximately 10 miles (the first 10) of the line are laid with 100-lb. jointed and 18 miles with 131-lb. jointed rail in fair to good condition, although the rail ends are battered in the 100-lb. material. The tie condition is poor with defective joint ties and defective clusters elsewhere. There are 95 rail-roadway at-grade crossings on the line segment and practically all of them have poor surfaces. A more detailed description is the subject of Table 1.

Rail Use

Almost 5,000 cars per year move over the line segment now and another 2,100 will in the future as the segment connection will become the singular interchange point with the Union Pacific (at present there are two).


IDAHO NORTHERN AND PACIFIC
REHABILITATION PROJECT
PAYETTE to EMMETT
PAYETTE
FRUITLAND
NEW PLYMOUTH
EMMETT
RIVER

Benefit-Cost Analysis

Project Alternative

The project alternative is rehabilitation and continued operation.

Null Alternative

The null alternative is continued operation over poor track.

Project Description and Costs

The project proposed consists principally of replacing 12,500 ties and associated improvements to create Class 2 FRA track safety standard conditions. The ballast section will also be significantly improved, rail anchors added, and most of the grade crossings reworked. The track will be surfaced and lined and the maximum speed increased to 25 mph. The estimated cost of the project is $1.33 million as detailed in Table 2.

Project Benefits

Placing the track in stable Class 2 condition will generate transportation benefits for the railroad relating to reduced costs in train operations and maintenance of way. Raising the permissible maximum speed to 25 mph for the 25 miles of the line segment that is not within yard limits will save one hour in running time per one-way trip over the segment. Based on a 6-day per week round trip over the segment, crew, locomotive, and freight car hire savings of $75,894 annually will result. The crew savings are significantly impacted by the avoidance of having to recrew about once a week due to violation of the hours of service law.

Maintenance of way savings also will be accrued from: avoidance of spot surfacing and correction of cross level constantly being performed due to the current lack of ballast to hold the surface; spot crossing surface repairs that do not contribute to needed long-term repair; and constant replacement of joint bars being cracked due to the lack of support. The maintenance savings benefits are estimated to total $143,827 per year. Thus, total annual benefits resulting from the project equate to $219, 721.

Benefit-Cost Ratio

Table 3 displays the present value of all costs and benefits. The present value of the project costs is $1,284,153, and the present value of the benefits is $1,847,999, providing a positive benefit-cost ratio of 1.44.

Table 1
LINE INVENTORY AND CONDITION
Idaho Northern and Pacific Railroad
Payette to Emmett

Mileposts	0.39 to 29.07			
Stations	Payette	0.4	Tom Thumb	8.8
	Eiffie	4.0	New Plymouth	11.1
	Fnuitland	5.1	Emmett	29.1
	Buckingham	6.8		
Rail	Approximately 18 miles of 131-lb. and 10.6 miles of 100-lb. jointed rail in fair to good condition. Rail ends are battered in 100-lb. material.			
Ties	Condition varies with defective ties comprising up to 80 percent of some track sections, however, poor joint ties and clusters of defective ties are typical.			
Tie Plates and Anchors	Fully plated. Track is anchored, but ineffective in many locations.			
Ballast	Light rock covering over native materials.			
Surface/Line	Line is fair to good, surface fair to poor.			
Bridges	Sixteen structures, mostly timber pile open deck trestles.			
Roadbed/Drainage	Roadbed lacks shoulders in places, two slide-outs on fills near Payette ditches need cleaning and problems exist with spoil from irrigation ditches blocking right-of-way drainage and fouling ballast.			
Grade Crossings	95 at grade rail-highway crossings, practically all with poor surfaces.			
Timetable Speed	10 mph, Payette MP/0.4, to New Plymouth, MP 11.1. 20 mph, New Plymouth to Emmett, MP 29.1.			
Weight Limit	263,000 lbs.			

Table 2
REHABILITATION COST ESTIMATE
Idaho Northern & Pacific Railway
(Class II Operation)

Cost Items	Miles	Unit Quantity	Unit	Unit Cost	Total Cost
Materials					
Bolts and Nutlocks New	25.00	108.0	Each	$3.00	$8,100
Anchors, New	25.00	1620.0	Each	0.85	34,425
Crossties, No. 1 Relay	25.00	500.0	Each	18.00	225,000
Spikes, New		208.0	Keg	73.00	15,184
Crossing Boards & Screws		2280.0	T.F.	60.00	136,800
Ballast	25.00	400.0	Ton	12.00	120,000
SUBTOTAL MATERIAL COST					**539,509**
Labor Costs					
Unload Ties and Remove Old Ties	25.00	500.0	Each	1.50	18,750
Unload Ballast	25.00	400.0	Tons	1.50	15,000
Install Crossties	25.00	500.0	Each	15.00	187,500
Install New & Adjust Old Anchors	25.00	4320.0	Each	0.35	37,800
Joint Servicing	25.00		Mile	2,500.00	62,500
Grade Crossings Including Paving		2280.0	T.F.	120.00	273,600
Surface and Line	25.00		Mile	7,920.00	198,000
SUBTOTAL LABOR COST					**$793,150**
REHABILITATION COST (Material and Labor)					**$1,332,659**
Less Salvage Value of Material Released					2,277
TOTAL REHABILITATION COST					**$1,330,382**

NOTE: Unit values current as of --> December 1994
SOURCE: Wilbur Smith Associates

Table 3
BENEFIT - COST ANALYSIS
Payette to Emmett
(1994 $)

Year	COSTS			BENEFITS							Present
	Rehab	NLV	Total Costs	Oper.	Track	RR P/(L)	Hwy	Salvage	Total Benefits	Net Benefits	Value Net Benefit
1994											
1995	1330382	0	1,330,382							(1,330,382)	(1,284,153)
1996			0	75,894	143,827	0	0		219,721	219,721	204,716
1997			0	75,894	143,827	0	0		219,721	219,721	197,602
1998			0	75,894	143,827	0	0		219,721	219,721	190,736
1999			0	75,894	143,827	0	0		219,721	219,721	184,108
2000			0	75,894	143,827	0	0		219,721	219,721	177,710
2001			0	75,894	143,827	0	0		219,721	219,721	171,535
2002			0	75,894	143,827	0	0		219,721	219,721	165,575
2003			0	75,894	143,827	0	0		219,721	219,721	159,821
2004			0	75,894	143,827	0	0		219,721	219,721	154,267
2005			0	75,894	143,827	0	0		219,721	219,721	148,907
2006			0					142,200	142,200	142,200	93,021
								93,021	1,847,999		
PV's	1,284,153	0	1,284,153	606,188	1,148,790	0	0	93,021	1,847,999	563,847	563,847

Discount Rate	3.60%	NPV	563,847	BALA\TBL-10.WK1
		B/C Ratio	1.44	12/15/94

Table 4
REHABILITATION COST ESTIMATE
Idaho Northern & Pacific Railway
PHASE I
(Class II Operation)

Cost Items	Miles	Unit Quantity	Unit	Unit Cost	Total Cost
Materials					
Bolts and Nutlocks New	10.60	108.0	Each	$3.00	$3,434
Anchors, New	10.60	1,620.0	Each	0.85	14,596
Crossties, No. 1 Relay	10.60	500.0	Each	18.00	95,400
Spikes, New		85.0	Keg	73.00	6,205
Crossing Boards & Screws		830.0	T.F.	60.00	49,800
Ballast	10.60	400.0	Ton	12.00	50,880
SUBTOTAL MATERIAL COST					**220,315**
Labor Costs					
Unload Ties and Remove Old Ties	10.60	500.0	Each	$1.5	$7950
Unload Ballast	10.60	400.0	Tons	1.50	6,360
Install Crossties	10.60	500.0	Each	15.00	79,500
Install New & Adjust Old Anchors	10.60	4,320.0	Each	0.35	16,027
Joint Servicing	10.60		Mile	2,500.00	26,500
Grade Crossings Including Paving		830.0	T.F.	120.00	99,600
Surface and Line	10.60		Mile	7,920.00	83,952
SUBTOTAL LABOR COST					**$319,889**
REHABILITATION COST (Material and Labor)					**$540,204**
Less Salvage Value of Material Released					965
TOTAL REHABILITATION COST					**$539,239**

NOTE: Unit values current as of --> December 1994
SOURCE: Wilbur Smith Associates

Project Ranking Procedure

Two basic criteria provide the means of ranking projects. The first is the immediacy of abandonment. A line in danger of being abandoned, assuming it passes the benefit-cost ratio test (in excess of 1.0), will receive assistance before one that is not so threatened. If more than one line is threatened by abandonment, the one in the most immediate danger will receive the preference. Beyond this criteria, projects are ranked by benefit-cost ratio -- the larger the ratio, the higher the assistance rank.

Project recommendations based on these criteria are presented to the Idaho Railroad Advisory Council by the ITD. The Advisory Council's recommendations are then forwarded to and reviewed by the Transportation Board for final approval.